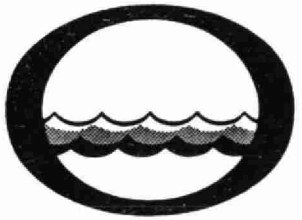
1971 OPERATING SUMMARY

WALLACEBURG

WATER POLLUTION CONTROL PLANT



Water management in Ontario

Ontario
Water Resources
Commission

We are pleased to submit for your consideration a summary of operation during 1971 of the water pollution control plant serving your community.

This operating summary contains parameters normally used to measure plant performance and loading, as well as relevant cost data. Because of the concern over eutrophication of our lakes and of the requirement, in many parts of Ontario, to remove the major contributing factor, results of analysis for phosphorus appear in this summary.

D. S. Caverly,
General Manager.

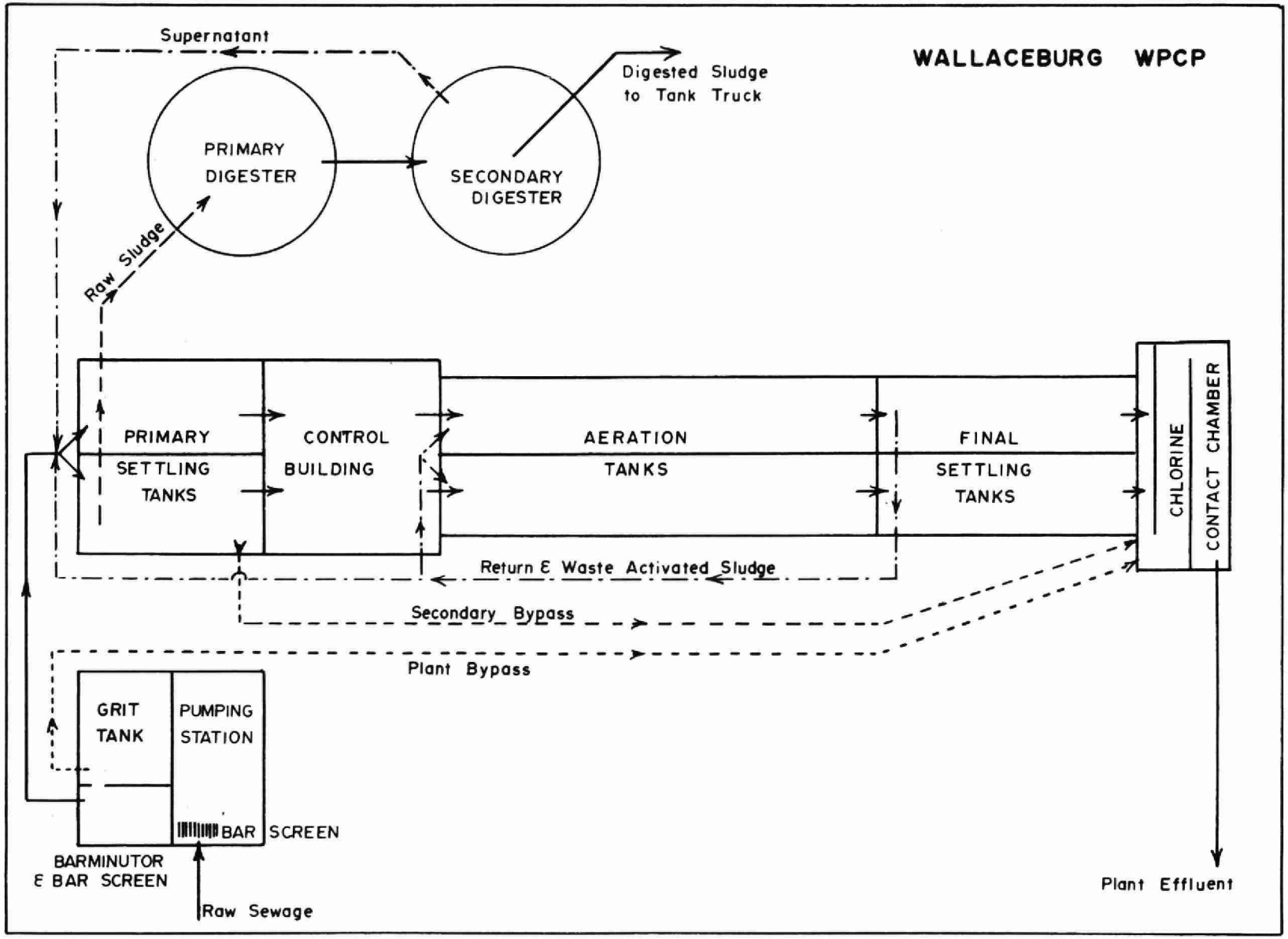
D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

WALLACEBURG

WATER POLLUTION CONTROL PLANT

1971 ANNUAL OPERATING SUMMARY

CONTENTS


WALLACEBURG WPCP
Supernatant
Digested Sludge to Tank Truck
PRIMARY DIGESTER
SECONDARY DIGESTER
Raw Sludge
PRIMARY SETTLING TANKS
CONTROL BUILDING
AERATION TANKS
FINAL SETTLING TANKS
CHLORINE CONTACT CHAMBER
Return & Waste Activated Sludge
Secondary Bypass
Plant Bypass
GRIT TANK
PUMPING STATION
BAR SCREEN
BARMINUTOR & BAR SCREEN
Raw Sewage
Plant Effluent

DESIGN DATA

PROJECT NO.	1-0087-67
DESIGN POPULATION	13,500
DESIGN LOADING	1.5 IMGD
DESIGN BOD LOADING	3,000 lb/day
DESIGN SS LOADING	3750 lb/day

COMMINUTION

No. of units - 1
Type: Barminutor

GRIT REMOVAL

No. of tanks - 1
Type: Aerated by diffusers

PRIMARY SEDIMENTATION

No. of tanks - 2
Tank dimensions: 16'x48'x14.5' each
Detention: 2.22 hours

AERATION

No. of tanks - 2
Type: aerated by diffusers
Tank dimensions: 16'x106'x13.25' each
Detention: 4.49 hours

SECONDARY SEDIMENTATION

No. of tanks - 2
Tank dimensions: 72'x16'x12.5' each
Detention: 2.68 hours

CHLORINATION

No. of tanks - 1
Detention: 21.8 min.

SLUDGE DIGESTION

No. of tanks - 2
Tank dimensions: one @ 35' dia x 19'
one @ 35' x 18.5'
Total Detention: 21.1 days

'71 Review

GENERAL

The project consists of a sewage treatment plant, sewage pumping stations and a sewer system. The plant employs the activated sludge process with 2 stage anaerobic sludge digestion and is designed for a hydraulic loading of 1.5 mgd and an organic loading of 3,000 pounds BOD per day. Two pumping stations were in operation in 1971 (one located on the plant site). More pumping stations and sewers will be incorporated into the project in the next few years as sewer service is extended to the remaining parts of the Town.

PLANT FLOWS and CHLORINATION

The total influent to the plant recorded in 1971 was 116 million gallons. The average day and maximum day flow recorded were .31 and .96 mgd respectively, which represents 20.7 and 64.1 percent of the plants hydraulic capacity. Flow to the plant remained well below capacity, as only about 1/3 of the Town had been connected to the sewer system in 1971.

The final effluent at this plant is to be disinfected by chlorination, 12 months per year. Due to problems with the start-up of chlorinating equipment, disinfection was not begun until March. A total of 5134 pounds of chlorine was used at an average dosage rate of 5.5 mg/l to maintain a residual of .5 mg/l in the effluent.

PLANT EFFICIENCY

The average BOD and suspended solids concentrations in the raw sewage were 72 mg/l and 145 mg/l respectively. Final effluent BOD and suspended solids concentrations averaged 6 mg/l and 8 mg/l respectively, which represent BOD and suspended solids reductions of 92 percent and 94 percent. The low BOD concentration in the raw sewage is believed to be due to infiltration of ground and surface water into the older part of the sewer system which drains to the Wellington Street and King Street pumping stations.

As 1971 was the first full year of operation for the plant, comparison cannot be made with the performance in previous years. The effluent quality was generally better than OWRC objectives with the exception of the month of January when the plant was subject to start-up problems.

An average of 1.2 cubic feet of grit per million gallons of sewage was removed.

SLUDGE DIGESTION and DISPOSAL

Due to the low flows associated with the start-up of the plant, raw sludge was by-passed to the aeration section until May when it was decided to place the digester in service. It was not necessary to withdraw digested sludge from the secondary digester until September. A total of 21,740 gallons of raw sludge was pumped to the digesters and 6,540 gallons of digested sludge was removed.

Ultimate disposal of the digested sludge was by application on agricultural land in Dover Township. This method of disposal utilizes the sludge as a soil fertilizer and conditioner.

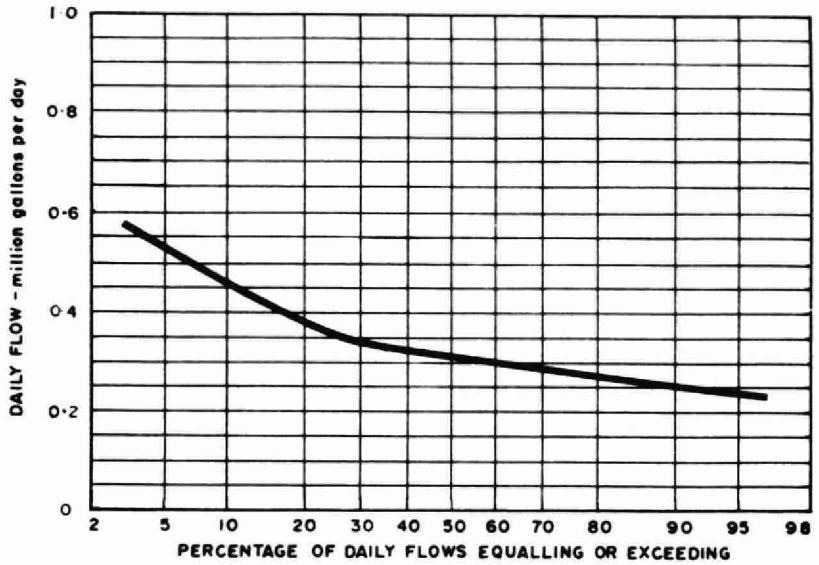
CONCLUSIONS

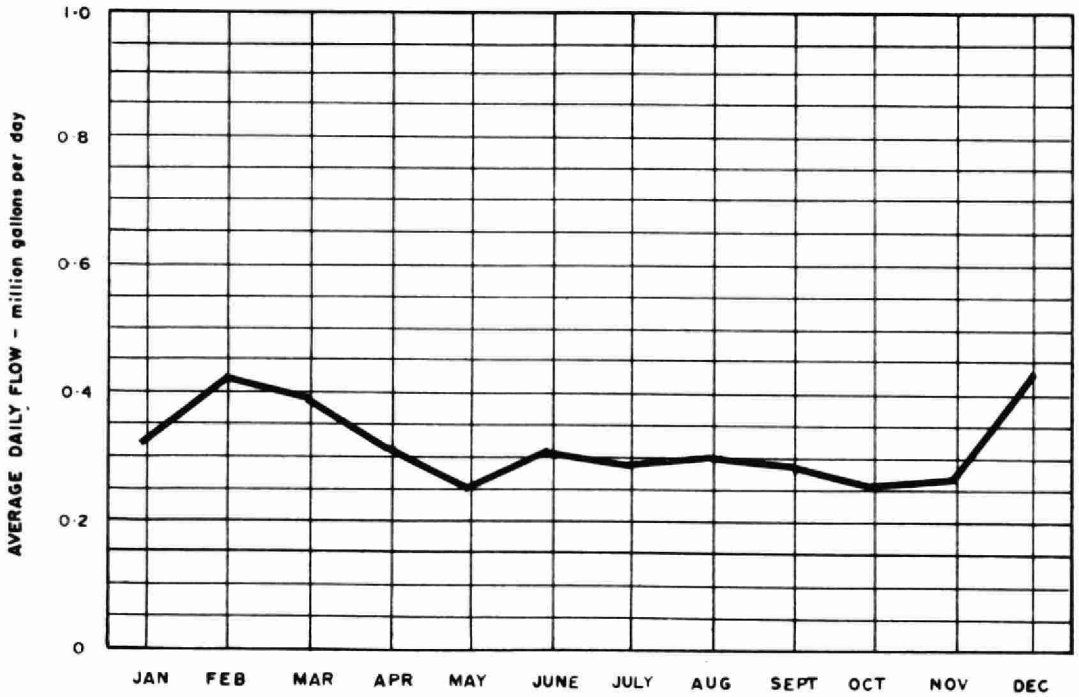
During 1971 the first full year of operation, the plant operated well below capacity due to the fact that only about 1/3 of the Town was connected to the sewer system. The certificate of completion for the construction of the plant was issued on January 21, 1971. Despite the low flows to the plant in 1971 and the various contract deficiencies that persisted during the year, operation of the plant was maintained at a high standard.

The quality of the plant effluent was generally well within the standards required set by the OWRC.

PROCESS DATA

FLOWS



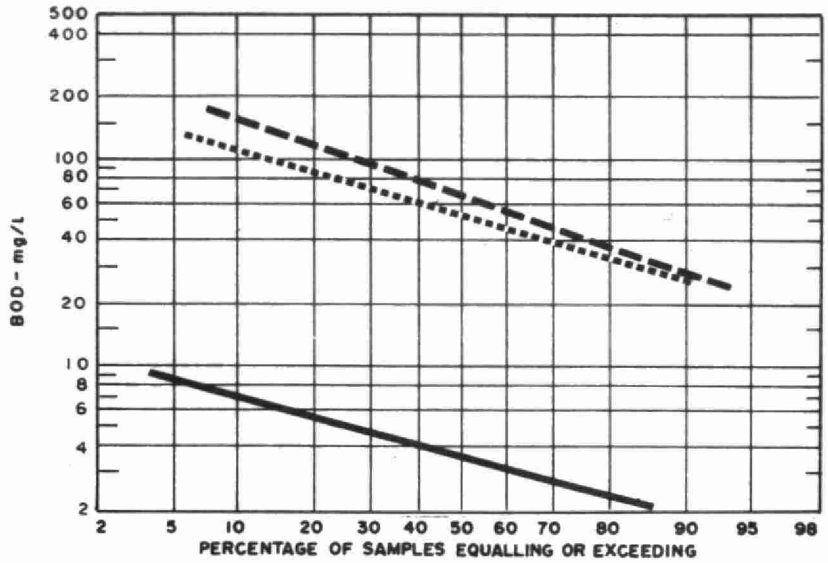


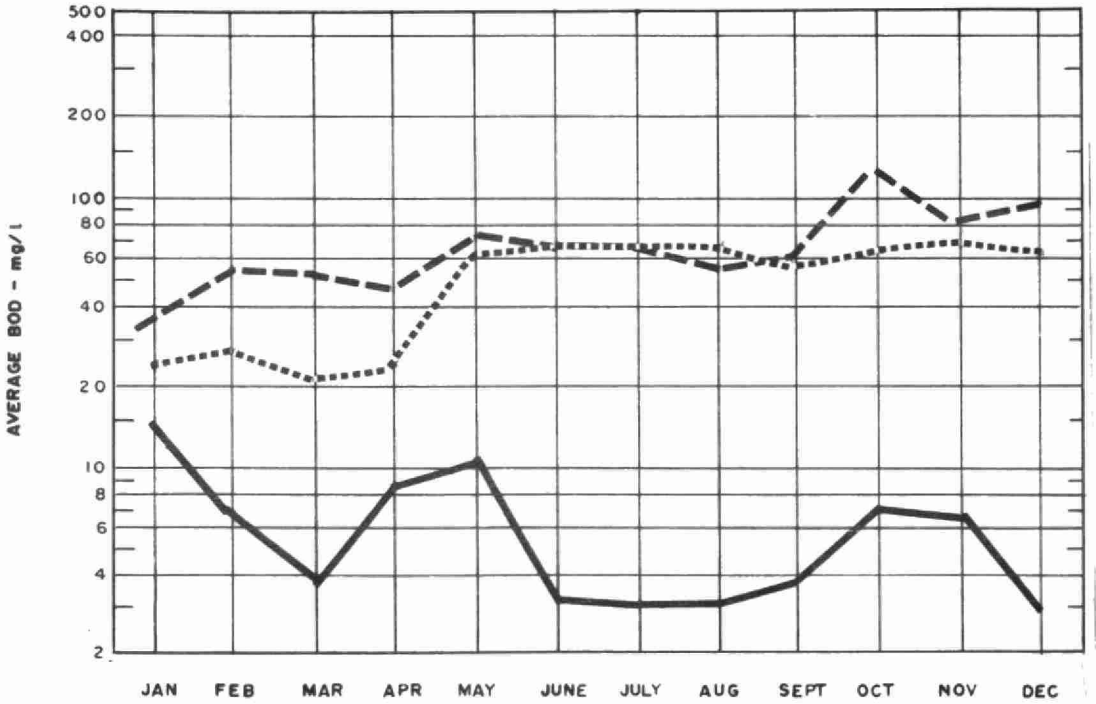
DESIGN CAPACITY _ _ _ _ _ _ _ _

PLANT PERFORMANCE

MONTH	FLOWS				BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				TOTAL PHOSPHORUS		
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	MAXIMUM RATE	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDN
	million gallons	mil gal	mil gal	mgd	mg/l	mg/l	%	10 3 pounds	mg/l	mg/l	%	10 3 pounds	mg/l as P	mg/l as P	%
JAN	10.13	.33	.61	.9	38	19	50	1.9	136	10	93	12.8	6	6	0
FEB	11.73	.42	.96	1.9	57	7	88	5.9	117	13	89	12.2	4	3	25
MAR	12.18	.39	.71	1.7	51	4	92	5.7	106	7	93	12.1	4	4	0
APR	9.25	.31	.69	1.2	49	9	82	3.7	119	7	94	10.4	6	5	17
MAY	7.75	.25	.34	1.9	77	10	87	5.2	113	19	83	7.3	6	6	0
JUNE	9.12	.30	.35	1.9	66	3	95	5.7	155	8	95	13.4	7	5	28
JULY	8.85	.29	.49	2.0	67	3	96	5.7	143	4	97	12.3	5	5	0
AUG	9.16	.30	.50	1.8	55	3	95	4.8	127	4	97	11.3	3	5	0
SEPT	8.50	.28	.41	1.8	61	4	93	4.8	223	4	98	11.6	5	5	0
OCT	7.79	.25	.34	1.6	116	7	94	8.5	159	9	94	11.7	5	6	0
NOV	8.40	.27	.39	1.7	81	7	91	6.2	133	8	94	10.5	6	6	0
DEC	13.20	.43	.93	1.8	93	3	97	11.9	92	4	96	11.6	4	3	25
TOTAL	116.06	-	-	-	-	-	-	70.0	-	-	-	137.2	-	-	-
AVG.	-	.31	MAXIMUM .96	MAXIMUM 2.0	72	6	92	5.8	135	8	94	11.4	5	5	0
No. of Samples	-	-	-	-	51	47	-	-	274	278	-	-	18	18	-

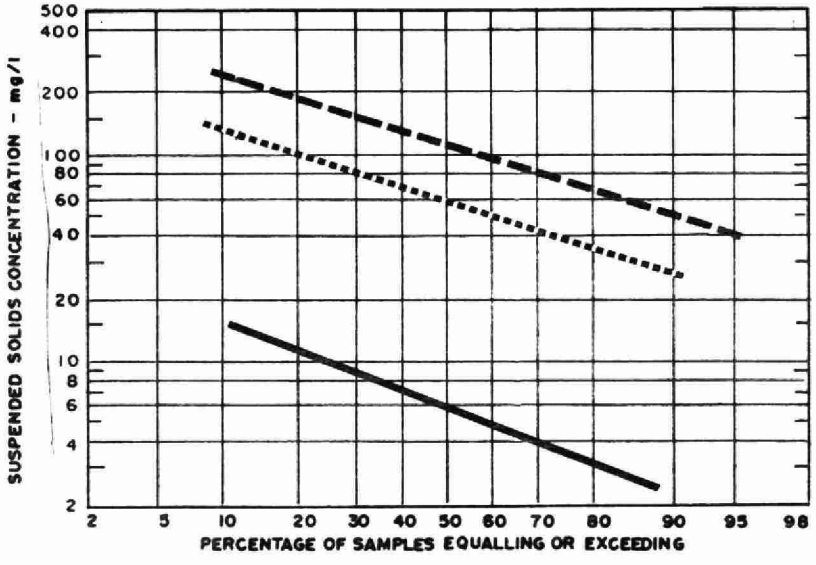
BIOCHEMICAL OXYGEN DEMAND

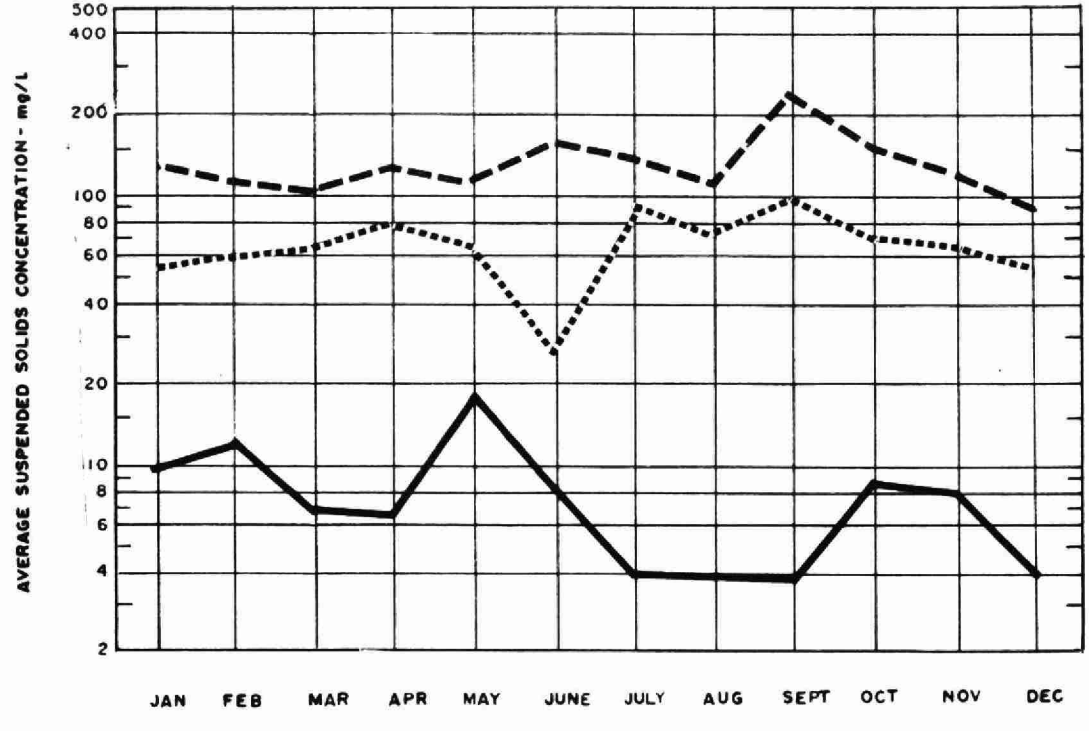




PLANT INFLUENT
PRIMARY EFFLUENT
PLANT EFFLUENT

SUSPENDED SOLIDS



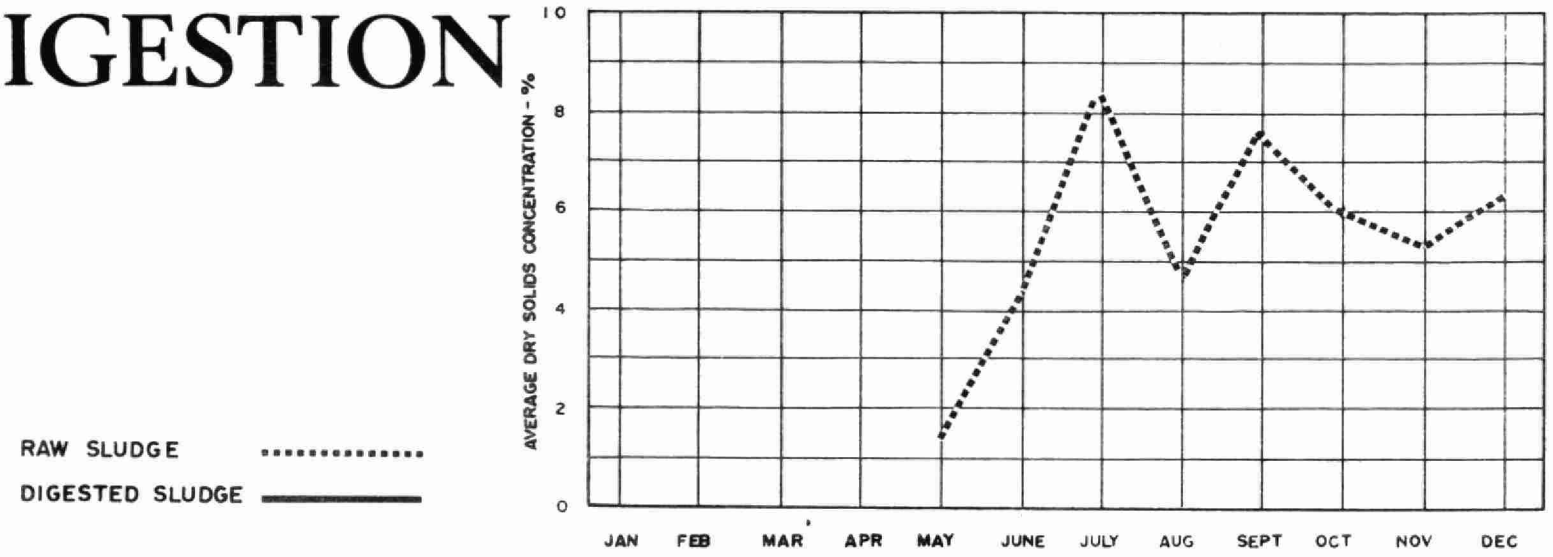


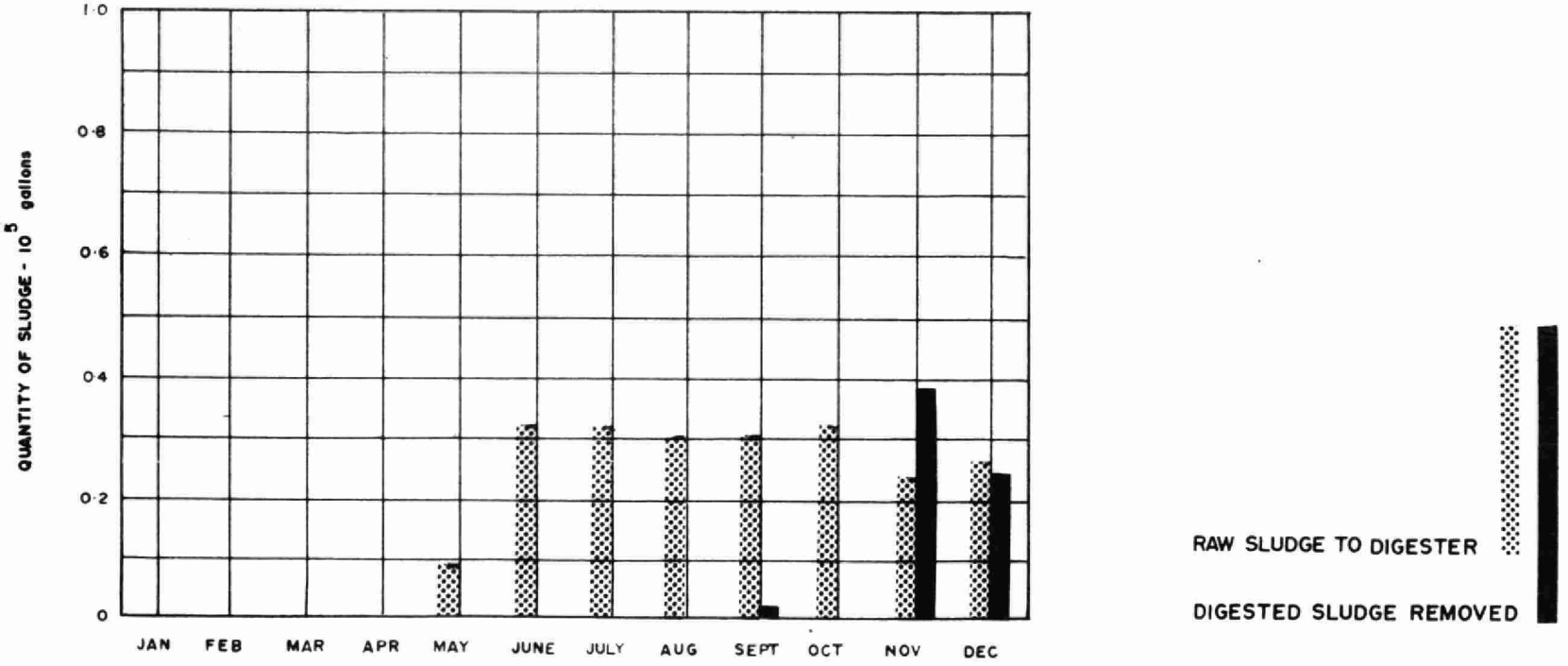
PLANT INFLUENT
PRIMARY EFFLUENT
PLANT EFFLUENT

TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
									RAW SLUDGE			DIGESTED SLUDGE			SUPER-NATANT	
	QUANTITY REMOVED	Cl_2 USED	AVG. DOSE	BOD	SUSPENDED SOLIDS	MLSS CONC	F/M	AIR	QUANTITY	TOTAL SOLIDS	VOL. SOLIDS	QUANTITY	TOTAL SOLIDS	VOL. SOLIDS	T. S.	AMOUNT HAULED
	cubic feet	10^3 pounds	mg/l	mg/l	mg/l	mg/l	day^{-1}	$\frac{1000\,ft^3}{lb\ BOD}$	10^3 gallons	%	%	10^3 gallons	%	%	%	cubic yards
JAN	0	0	-	24	59	2980	.02	9.4	-	-	-	0	-	-	-	0
FEB	0	0	-	28	60	3430	.02	18.2	-	-	-	0	-	-	-	0
MAR	24	496	4.5	21	66	3400	.02	22.7	-	-	-	0	-	-	-	0
APR	24	278	5.2	26	77	2570	.02	28.3	-	-	-	0	-	-	-	0
MAY	18	510	6.6	62	67	1440	.08	12.3	9.9	1.6	57	0	-	-	-	0
JUNE	0	571	6.3	69	28	1380	.11	7.6	33.4	4.3	63	0	-	-	-	0
JULY	30	476	5.4	64	94	1870	.01	8.5	32.6	8.4	47	0	-	-	-	0
AUG	18	481	5.3	66	74	1320	.10	7.9	30.1	4.7	48	0	-	-	-	0
SEPT	12	383	4.5	58	99	1730	.07	9.9	30.9	7.7	51	1.1	2.4	-	-	7
OCT	6	512	6.6	65	71	1460	.08	10.3	31.2	6.0	59	0	-	-	-	0
NOV	6	482	5.7	68	64	1460	.09	8.5	23.1	5.3	65	39.5	-	-	-	234
DEC	0	754	5.7	61	54	1350	.14	5.6	26.2	6.3	52	24.8	-	-	-	147
TOTAL	138	5143	-	-	-	-	-	-	-	-	-	65.4	-	-	-	388
AVG.	1.2 cu. ft/mil gal	514	5.5	57	68	2030	.06	12.4	27.2	5.5	55	5.5	-	-	-	32

DIGESTION


AVERAGE DRY SOLIDS CONCENTRATION - %
10
8
6
4
2
0
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
RAW SLUDGE
DIGESTED SLUDGE


QUANTITY OF SLUDGE - 10^5 gallons
1·0
0·8
0·6
0·4
0·2
0
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
RAW SLUDGE TO DIGESTER
DIGESTED SLUDGE REMOVED